

ABSTRACT OF THE DISCLOSURE

An electron device which controls quantum chaos wherein a quantum chaos property is controlled extensively and externally is provided. The electron device which controls quantum chaos is manufactured by using a single material. A heterojunction provided with a first region having an electron system characterized by quantum chaos and a second region having an electron system characterized by integrability is formed. The first region and the second region are adjacent to each other, and the heterojunction is capable of exchanging electrons between the first region and the second region. A quantum chaos property of an electron system in a system formed of the first region and the second region is controlled by applying to the heterojunction an electric field having a component perpendicular to at least a junction surface.